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ABSTRACT

For many teachers of reading comprehension, the establishment of communicative competence as the important criterion of analysis has brought about new and interesting insights into their work. But as more and more analyses of written texts refer to communicative analysis, it may be time to pause and think about what different people mean by communication when talking about reading skills. The following paper describes communication, as defined by researchers at C.R.A.P.E.L. in their attempt to improve the communicative competence of students in relation to reading as an individual skill. The discourse level is distinguished from the communicative level, and this division is explained by means of an analysis of three texts, two scientific and one general. Criteria for distinguishing between the two levels are proposed, as well as directions for further research. (Author/CLK)

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MELANGES PEDAGOGIQUES 1977

M.-J. GREMMO

READING AS COMMUNICATION

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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RESUME

Cet article s'inscrit dans les recherches faites dans le domaine de l'analyse communicative appliquée au discours écrit. L'auteur présente le travail effectué par un groupe de recherche du C.R.A.P.E.L., qui vise à apporter une nouvelle direction d'analyse dans ce domaine. En effet, elle propose de distinguer :

— le niveau *discursif*, où seraient regroupées les anciennes catégories communicatives telles que description, définition, etc...

— le niveau *communicatif*, qui comprendrait des actes de communication tels que informer, justifier, critiquer, etc...

Dans une deuxième partie, l'auteur justifie cette division en discutant les analyses de trois textes (deux tirés de textes scientifiques, un de la presse générale), faites selon ces deux niveaux indépendants ; et elle propose des explications pour la confusion entre discursif et communicatif.

Enfin, l'auteur tire de cette nouvelle théorisation des directions d'analyse plus précises.

This paper was read in a slightly different form at the BAAL seminar on " Communicative Methodology " held in Bath, April 19-21, 1977.

For many teachers of reading comprehension, the establishment of communicative competence as the important criterion of analysis has brought about new and interesting insights into their work. But as more and more analyses of written texts refer to communicative analysis, it may be time to pause and think about what different people mean by communication when talking about reading skills. The following paper describes what a group of researchers [1] at C.R.A.P.E.L. have come to define as communication, in their attempt to improve the communicative competence of students in relation to reading as an individual skill.

I. THEORITICAL FRAMEWORK

At Nancy, our interest in communicative analysis has come from the realization that our students still had reading problems after most of their " linguistic " problems (that is, problems on the level of linguistic competence) were solved. So we turned towards the existent communicative analyses for help in solving our students' learning problems. We had two main directions to turn to :

— analyses of oral discourse,

— analyses of written scientific discourse.

We found that neither approach was very helpful in our case.

[1] The group consists of Danièle ABE, Jacqueline BILLANT, Pascale FADE, Harvey MOULDEN, Richard DUDA, O. REGENT and the author.

Analyses of oral discourse :

Oral communication and written communication are basically different in nature. This may seem old hat, but it may need to be kept in mind as new directions of research in communicative analysis develop.

Written communication is a delayed interaction, where the written discourse is not a collective construction by both the reader and the writer as oral discourse is. The communication has in fact two stages : the writer's encoding phase, and the reader's decoding phase. The person communicated to — that is, the reader — has no influence on the discourse as a finished product, whereas oral discourse is a mutual negotiation.

The specific aspects of written communication derive from this difference in nature :

— it is a closed discourse. The writer knows what conceptual content he wants to put forward before he actually writes it down,

— it is in fact the optimum version (that is, as judged by the writer) of a number of other possibilities,

— it obeys strict construction rules, at the morpho-syntactical, grammatical and rhetorical levels. These rules are predetermined specifically for each language (this is why the same conceptual content treated by an Englishman and a Frenchman will give two very different texts), but also for each cultural field (this is why for example, Japanese people are so difficult to understand, even if they know English very well).

Of course, by pointing out these differences, I do not mean to say that there are two distinct categories of communication : written on one hand, oral on the other. But these features may serve as distinctive features — among others — to classify all kinds of communication along a continuum. For example, at the written end of oral communication would be the communication happening in a lecture : a lecture resembles a written communication in that :

— the conceptual content is closed,

— listeners cannot intervene (in fact, as the situation is defined, it would be rude of them to do so, even if they felt like it !), but it is little delayed because this closed discourse can be entirely revised — and even destroyed — by the discussion that could take place afterwards. Moreover, if a lecture has to appear in print, it will certainly be slightly different from the lecture read aloud.

On the other hand, at the oral end of written communication would be the personal letters people write to their friends. These obey much less strict rules than for example scientific discourse does, and call for a reply is clearly obvious.

This difference leads us to claim that we need an altogether specific analysis for written texts. This is not new in the communicative competence field. Communicative analyses for written texts exist, but they are generally about scientific English for Special Purposes [2] texts. So our second move was to get interested in this type of analyses, trying to adapt their methodology to our texts.

Analyses of written discourse :

First of all, we found that there was a difference between ESP corpuses and ours. ESP communicative analyses derived from analyzing mostly science textbooks, which are not what even our ESP students have to read. Our students, who range from Law to Science students, have to complement their lectures given in French) by reading articles from the general press or from specialized magazines in English. But all their " textbooks " are in French.

There is also a big difference in the nature of these students : ESP students in England are mostly non-European, and they are not at all familiar with the traditional scientific conceptualization of European scientists, even at a very basic level. Our students' problems are inside the western scientific culture : it just happens that English serves as a lingua franca for science nowadays.

Thus we found two main drawbacks in the ESP approach :

— first, the pedagogical materials available were far too simple for our students. Since the content and the communicative categories derived from it seemed so obvious to most of them, they quickly refused to work with such simplified material which did not seem to meet their needs.

— secondly — and this the most important reason — when trying to apply this methodology to texts closer to those that our students had to read, we found that the simplicity of the texts in the ESP corpuses had allowed the analysts to overlook phenomena that we encountered in our texts.

There are common points between texts from science textbooks and the texts, which range from controversial texts in scientific magazines to editorials from the general press. These common points are examples of categories such as definition, explanation, classification, etc... that is the categories established by

[2] We will now use the abbreviation ESP.

ESP researchers. But these categories are not *communicative*, they are in fact part of the *rhetorical* — or, as we prefer to call it, *discursive* — organisation of a text and of the hierarchization of information, and they serve varied communicative purposes according to the communicative purpose of the writer. I will try to demonstrate this most vital point later when we discuss the CRAPEL analyses of the three texts below.

The CRAPEL model :

The texts on which our analysis is based range form scientific articles to editorials of the " general press ". We found that we could classify sentences from our texts in such categories as ESP analyses had defined for ESP text, that is definition, explanation, classification, etc... But trying to call these categories communicative simply did not seem to work (see the discussion of the examples below), they are in fact part of the discursive organisation of a text. Through them, the writer organises his concepts and selects the way in which these concepts are to be linked and presented to the reader, to make his communicative purposes come through in the best possible manner (in his opinion). So being aware of this differenciation, we have developed an analysis of written texts along three separate lines :

1) the *propositional content*, which is the subject of content analysis and is not our immediate purpose,

2) the *communicative value* of the text as a whole, and of different sentences and groups of sentences — that is, the function the author wants to put into his message, or parts of his message,

3) the *discursive organisation* of sentences among themselves and from group to group : each sentence has a role either in regard to the preceeding and/or succeeding sentences, or in regard to the preceeding and/or succeeding group of sentences, or both. The varied importance of these relationships brings a hierarchization of the information (taken in a general sense) carried through a written text.

The categorization of the discursive organization of a text can be made along two levels of delicacy :

1) *the micro-discursive level*, which analyses more precisely the relationship between one sentence and the next. Choosing the sentence as our basic unit of analysis is essentially justified by the fact that our students -and I think the average reader and the average writer (at least not the literary writer), tend to consider the sentence as the unit of meaning of written discourse. We are quite aware of the problems and limitations that this choice can bring, but it seemed a workable enough solution on the theoretical side while on the pedagogical side it allowed us to start from the student's experience.

2) the second level delicacy we have called *the macro-discursive level.* The macro-level analyses the relationships between groups of sentences. This level is least accessible to the foreign reader, because while the actual typographic grouping may correspond to the grouping the writer has decided, it very often does not (especially in general press articles), for the simple reason that the grouping is made by the printer, purely on aesthetical grounds. Moreover, when people start learning a foreign language, the learning process takes place at sentencial level (whether grammatical or morpho-syntactical). So students find it very difficult to apprehend the higher levels of signification once they are confronted with an authentic written text.

At the macro level of the discursive organization of the text, it appears that for a student to fully understand a text, it is vital to identify the sentences fulfilling the role we have termed POSITING. The POSITING sentences are differentiated by the fact that they are not related to the directly preceeding or succeeding sentence but correspond to the hierarchization of the information carried through a text. They often could start a text on their own. The POSITING sentences of one particular text, grouped together, can serve as an ' acceptable ' summary of the text.

II. DISCUSSION ABOUT THREE EXAMPLES

Nature of the texts

The text *Pore Morphology*, which will be referred to as text 1, has been taken out of a college textbook. *A Generative CAI Tutor for Computer Science Concepts* (referred to as text 2) is taken out of the minutes of an American Conference on computing. Text 3, *Europe under Pressure* is the editorial of the Washington Post as published in the Guardian Weekly of November 14, 1976.

These texts have been chosen because they illustrate the range of written materials our ESP students may encounter : from a schoolbook text — the kind of texts people usually refer to as ESP texts —, through a scientific article appearing in a specialised publication, to an article published in a widely distributed paper of " general interest ".

Explanations of the analyses

Each of these 3 texts is accompanied by a schema resulting from the analysis along discursive and communicative levels. Each sentence has been given a number.

Discursive level :

Micro level is represented by the label given to each sentence, regardless of its position.

Macro grouping are represented by headings in capital letters and their internal organization by indentation.

For example, the block : 11 Positing
12
Explanation
13
14 Consequence
15 Consequence

taken from the analysis of text 3 is thus to be read :

There is a macro group-sentences 11 to 15-of which sentence 11 is the expository (or POSITING) part. From sentence 11, depend sentences 12 and 13 which play the same role, explanation and from the group 12-13 depends sentence 14 which is a consequence, and from which sentence 15 depends as a consequence too.

For the definition of the discursive labels at micro level, see Annexe 1.

Communicative level :

Communicative values are shown on the right of the analysis sheet. As long as a second label does not appear, the label above is still valid. It is to be noted then that communicative values are fewer and less varied.

Discussion

Through the comparison of the analyses of these three texts, we would like to demonstrate that :

a) what has been called communicative categories of written discourse are in fact discursive categories,

b) this confusion stems from the fact that ESP textbooks fulfill very few communicative functions and are discursively simpler.

a) Discursive or communicative ?

1. We will choose as an example the categorie called " description ". In text 2, sentences [3-4] and sentences [5-9] are descriptions. But there, the author

does not use 2 descriptions just to describe an object (here an educational computer) as would have a communicative understanding of description. On the contrary, the author uses the discursive form description to convey two different communicative values : whereas [5-6] — discursively a description — is used to inform the reader, [3-4] — discursively a description too —, because of extra-discourse factors such as choice of words or its dependence from sentence [1], is used to criticize, justifying the overall criticism already conveyed by [1].

2. This can also be shown for the " exemplification " label if we compare

Text 2 : sentences [21-24] - [25]

Text 3 : sentences [16] - [17-18]

Both sentences [25] and [17-18], are clear examples of exemplification at the macro discursive level, but the communicative values of these two exemplifications are very different. The exemplification in text 2 is simply meant to add further information whereas the exemplification in text 3 is meant to prove the author's assertion posited in sentence 16. Thus, sentence 25 belongs to the same communicative group as sentences [21-24], while sentences [17-18] stand on their own. This analysis is confirmed by the fact that the reader could skip sentence [25] in text 2 without losing the threat of the argument, but could not possibly skip sentences [17-18] in text 3 without missing an important qualification to the author's argument. And yet these sentences have the same discursive values.

b) Why the confusion ?

1) We would like to claim that the confusion between *communicative* and *discursive* categories comes from the very nature of the text of ESP corpuses.

When you compare ESP textbooks materials to other articles taken out of other kinds of publications, you immediately notice the " poverty " of the communicative values of ESP textbooks. Poverty should not be taken in a pejorative sense : the role of textbooks is to bring students (that is, learners of subject matter) to the generally admitted level of knowledge common to all scientists of this subject matter. Writers of textbooks tread on firm ground : no need for them to criticize, or persuade or extoll. They just have to inform students about what is known so that they can learn. Thus, the communicative value of a text out of a textbook could only be one of informing.

Being unique, and valid for all textbooks, this level was then not relevant to the analyst. It is only because our corpus was different that the communicative values of a text appeared more numerous and complex and had to be taken in account.

In text 1 : we find the following communicative " values " :

— inform
— advise
— refer.

The two last ones (advise and refer) are even peripheral, since they are used by the author to help the student through his learning.

E.g. sentence 23 : this is a very important porosity type means : " I, as a teacher, tells you, students that this is one type you must know ".

Sentence 7 : " I, as a teacher, think that this book will help you most in your learning ".

So they concern not so much the content of the text as the learning situation.

On the contrary in texts 2 and 3, we encounter more varied communicative values, and in text 3 the communicative value " proving " appears. This shows that we have abandoned the domain of generally accepted knowledge (as in textbooks) to enter the universal domain of individual opinions.

2) Discursive differences of the different kinds of texts may also explain this confusion. Textbooks, if compared to other kinds of texts, appear to be in fact a reduction of the wide range of discursive possibilities offered to an author.

Through a comparison of the discursive schematisation of the 3 texts, the following points can be made.

— The discursive organisation becomes more intricate from text 1 to text 3. First of all the categories represented are fewer and less varied : description, definition, exemplification. These categories form the core of discursive values in scientific discourse.

Sentences (as a discursive unit) do not play exactly the same role. In text 1, one sentence very often represents one step of the macro level, whereas in text 3, steps are marked by groups of sentences. This is most obvious of POSITING sentences : in text 1, sentences [3]-[12]-[13]

in text 3, groups [1], [3-6], [11], [16], [25], [33-34].

— This discursive organisation, on the other hand, becomes less obvious from text 1 to text 3.

A discursive organisation is usually made obvious by the use of discursive performatives. Discursive performatives are sentences which refer directly to the organisation of the text, in which the writer tells you what he's going to do, or what he's just done — examples of discursive performatives therefore are titles ; paragraph titles and sentences like " *(...x...) will be discussed later* ".

In text 3, one can notice a high proportion of discursive performatives (8 out of 27 sentences). The percentage is lower for text 2 (5 out of 50 sentences) and is nearly nil for text 3 (only the title can be considered as a performative).

CONCLUSION

This division between two distinct and independent levels of analysis has thus been necessitated by the complexity of the text our students want to be able to read. This division is the first step in our desire to establish an analytical grid for written texts, which can be used by a language learner.

What we are now concerned about is :

— the establishment of formal criteria to enable a learner to recognize the discursive organisation of text.

— the categorization of the discursive features of a text, which will be unspecific enough to be able to describe corpuses through to texts of " general interests ".

— the relationship between discursive and communicative levels of a text — if any —, because one must not forget that the communicative value is still the purpose of the text, conveyed through the use of discursive categories.

In trying to analyse written texts in this light, we hope to be able to bring new arguments to the building of communicative analysis. But we are quite aware that, for the time being, our theorization is still tentative and can be subject to revision.

FOR TYPOGRAPHICAL CONVENIENCE, THE TEXTS DO NOT APPEAR IN THEIR ORIGINAL FORMAT.

TEXT 1

(Taken out of An Introduction to Sedimentology, pages 28-29)

1. B. Pore Morphology

2. 1. Introduction and Classification

3. Any petrophysical study of a reservoir rock necessitates a detailed description of the amount, type and genesis of its porosity. *4.* The quantitative measurement of porosity has been described in the previous section. *5.* The classification of the main types of porosity will now be discussed and followed by a description of the commoner varieties of pores. *6.* A large number of adjectives have been used to describe the different types of porosity present in sediments. *7.* Choquette and Pray (1970, pp. 244-250) have given a useful glossary of pore terminology. *8.* The pores themselves may be studied by a variety of methods ranging from examination of rough or polished rock surfaces by handlens or stereoscopic microscope, through study of thin sections using a petrological microscope, to the use of the scanning electron microscope. *9.* Another effective technique of studying pore fabric is to impregnate the rock with a suitable plastic resin and then to dissolve the rock itself with an appropriate solvent. *10.* Examination of the residue gives some indication, not only of the size and shape of the pores themselves, but also of the throat passages which connect pores. *11.* The minimum size of throats and the tortuosity of pore systems are closely related to the permeability of the rock.
12. These different observational methods show that there are a wide number of different types of pore systems.
13. Various attempts have been made to classify porosity types. *14.* These range from essentially descriptive schemes (e.g. Levorsen, 1967, p. 113), to those which combine descriptive and genetic criteria (e.g. Choquette and Pray, 1970), and those which relate the porosity type to the petrography of the host rock (e.g. Robinson, 1966).
15. The classification shown in Table V divides porosity into two main varieties

which are commonly recognized (e.g. Murray, 1960). *16.* These are primary porosity fabrics, which were present immediately after the rock had been deposited, and secondary or post-depositional fabrics which formed after sedimentation by a variety of causes.
17. The main porosity types will now be described and illustrated.

Table V

A classification of porosity types

	Type		Origin
I. Primary or depositional	(a)	Intergranular or interparticle	Sedimentation
	(b)	Intraparticle	
II. Secondary or post-depositional	(c)	Intercrystalline	Cementation
	(d)	Fenestral	
	(e)	Moldic	Solution
	(f)	Vuggy	
	(g)	Fracture	Tectonic movement, compaction or dehydration

18. 2. Primary or Depositional Porosity

19. Primary or depositional porosity is that which, by definition, forms when a sediment is laid down. *20.* Two main types of primary porosity may be recognized.

21. a. Intergranular porosity

22. Intergranular or interparticle porosity occurs in the spaces between the detrital grains which form the framework of a sediment (Fig. 12a). *23.* This is a very important porosity type. *24.* It is present initially in almost all sedimentary rocks. *25.* Intergranular porosity is generally progressively reduced by diagenesis in many carbonates, but is the dominant porosity type found in sandstones.

TEXT 1

Discursive	*Communicative*
1 performative	
2 performative	
3 POSITING	
4 performative (anaphoric)	
5 performative (cataphoric)	
6	*Inform*
7	*Advise*
8 — 10 Description	
8 — general	
9 — 10 particular	
11 : result	*Inform*
12 POSITING	
13 POSITING	
14 Exemplification	
15 Exemplification . 15 reference	
16 definition	
17 performative	
TABLE V POSITING	
From 18 on, at the macro level EXPLICITATION OF TABLE V	
18 perfon..ative	
19 definition	
20 performative	*Inform*
21 performative	
22 definition	
23 evaluation	*Advise*
24 description	*Inform*
25	

Any petrophysical study of a reservoir rock necessitates a detailed description of the amount, type and genesis of its porosity. (These) observational methods show that there are a wide number of different types of pore systems. Various attempts have been made to classify porosity types. TABLE V

TEXT 2

Taken out of Acts of the Spring Joint Computer Conference, 1972, pages 379-380

A generative CAI tutor for computer science concepts *

by ELLIOT B. KOFFMAN
University of Connecticut
Storrs, Connecticut

INTRODUCTION

1. Limited progress has been made in software for computer-assisted instruction. *2.* Frame-oriented CAI systems have dominated the field. *3.* These systems function as mechanized programmed texts and utilize the computational power of the computer to a minimal extent. *4.* In addition, they are difficult to modify and tend to provide a fairly fixed instructional sequence.
5. The conventional frame-oriented CAI system is organized as a series of frames. *6.* A frame may present a piece of information and/or ask a question. *7.* The questions are normally objective and often are of the multiple-choice type. *8.* The frames are usually linked in a sequential fashion and a student will cycle through them one at a time. *9.* Frames may be presented on a teletype, a graphical display, a slide projector, via an audio track, or any combination of the above. *10.* There are severe problems inherent in systems of this type. *11.* All questions must be specified by the course-author as well as a set of anticipated student responses to each question. *12.* If branching is to occur, explicit instructions must be given indicating the performance criteria for a branch and the new continuation point in the program.
13. Since everything must be specified in advance, extensive time must be spent in preparing course material for presentation. *14.* Furthermore, once programmed this material has very little flexibility. *15.* Modifying the set of questions to be asked of the student or the material to be presented is a major undertaking and much reprogramming must be done.

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* This research is sponsored by the Connecticut Research Commission under Grant RSA-71-7.

16. This type of system is not very useful in teaching quantitative courses. *17.* Subject areas such as engineering or the physical sciences are concerned with teaching techniques of problem solving. *18.* Problem solving competence is often acquired through a process of " learning by doing ". *19.* Consequently, it is essential that the CAI system be capable of presenting a wide variety of problems and solutions to the student. *20.* Reprogramming each problem and its solution in a manner suitable for presentation by CAI would be extremely inefficient.

21. It is precisely for these reasons that generative CAI systems have recently become of great interest. *22.* Generative systems are capable of generating a series of questions (and answers to these questions) as a function of the student interaction. *23.* These systems can be divided into two classes. *24.* Those which are oriented toward the " soft-sciences " and textual material and those which are more concerned with numerical manipulations and quantitative material.

25. Carbonell [1] and Wexler [2] have designed generative CAI systems which have been used to teach concepts in geography. *26.* These systems are organized around an information structure or network. *27.* Carbonell uses the semantic network developed by Quillian [3].

28. Once the information network has been specified, these systems are capable of generating a sequence of questions for a student. *29.* As each question is generated, the answer is retrieved for comparison with the student's response. *30.* If the student is incorrect, Wexler's system is capable of providing individualized remedial comments. *31.* This would consist of either a correct and relevant statement using the student's incorrect answer or a systematic presentation of the steps performed by the system in deriving the correct solution. *32.* Both these systems allow the student to interrupt and pursue topics which interest him at greater depth.

33. The potential for incorporating generative CAI in the " hard sciences " is extensive. *34.* Algorithms for solution of classes of problems could be incorporated into CAI systems. *35.* In some cases, solution techniques might be sufficiently complex that heuristic programs would be necessary. *36.* Examples of the latter case would be teaching symbolic integration or proving theorems. *37.* In any event, CAI systems organized around a set of algorithms would have the capability to generate and solve a wide range of problems.

38. An extensive project in the subject area of analytical geometry has been described by Uttal [4]. *39.* His system is capable of generating twelve problem types which are representative of the problems found in an analytical geometry course. *40.* These problems usually involve an expression or graphical representation of a particular conic section. *41.* The expression is obtained from the general quadratic equation $AX^2 + BY^2 + CX + DY + E = 0$.

42. The required expression is obtained by setting certain coefficients to O and selecting the others at random. 43. The complexity of the equation generated depends on the constraints imposed on the coefficients. 44. For example, to generate circles centered at the origin, $A = B$ and $C = D = O$.
45. Associated with each of the twelve problem types is an answer routine. 46. The routine which determines if a randomly generated point (x,y) falls on the locus represented by a randomly generated equation simply plugs this point into the equation. 47. The expression generator itself is used as the answer routine when the student is asked to supply the equation for a conic section with given standard characteristics.
48. The following sections will describe a generative tutor that has been used in an introductory computer science course. 49. It has been used to teach concepts of digital circuit design as well as to introduce students to machine language programming. 50. Because of the large number of concepts covered, an intelligent " concept selector " has been designed which attempts to tailor the current instruction each student receives to fit his past performance record.

TEXT 2

Discursive	Communicative
Title : performative	*Inform*
Subtitle : performative	
1-4 POSITING	*Criticize*
1 Commentary	
2 Performative	
3 Explanation	*Justify*
4 Description	
5-9 Description (development of 3)	*Inform*
5	
6	
7	
8	
9	
10-20 Description (Development of 4)	*Criticize*
10 performative	
11-15 explanation	
11	
12	
13	
14	
15	
16-20 consequence	*Criticize*
16 performative	
17 characterization	*Inform*
18 description	
19 Consequence	*Justify*
20 Evaluation	*Criticize*
21-37	*Inform*
21-24 POSITING	
25-32 exemplification	
25 exemplification	
26 definition	*Inform +*
27 characterization	*Extoll*

Discursive	Communicative
28	
29 description	
30	
31 characterization	
32 consequence	
33-47 exemplification	
33 Evaluation	*Extoll*
34-37 explicitation	*Justify*
34 exemplification	
35 exemplification	
36 exemplification	
37 evaluation	*Extoll*
38-47 exemplification	*Inform*
38 exemplification	
39 characterization	
40 characterization	
41 description	
42 description	
43 description	
44 exemplification	
45 characterization	
46 exemplification	
47 exemplification	
48 performative (cataphoric)	
49 description	
50 characterization	

Limited progress has been made in software for computer-assisted instruction. Frame-oriented CAI systems have dominated the field. These systems function as mechanized programmed texts and utilize the computational power of the computer to a minimal extent. In addition, they are difficult to modify and tend to provide a fairly fixed instructional sequence. It is precisely for these reasons that generative CAI systems have recently become of great interest. Generative systems are capable of generating a series of questions (and answers to these questions) as a function of the student interaction. These systems can be divided into two classes. Those which are oriented towards the " soft science " and textual material and those which are more concerned with numerical manipulations and quantitative material.

TEXT 3

Taken out of THE GUARDIAN WEEKLY, Nov. 14, 1976

The Washington Post

Europe Under Pressure

1. THE ECONOMICS of the mid-1970s are creating a special kind of hell for governments and politicians throughout Western Europe. *2.* The staggering decline of the British pound is only the most dramatic sign of the trouble, and it isn't confined to Britain. *3.* Over the last two decades all the Western European countries have built expensive structures of social benefits and security, based on the assumption of strong economic growth. *4.* Now they have begun to realize that growth is unlikely to continue at a rate capable of sustaining these benefits, or the accustomed levels of high employment. *5.* They are all trying to steer resources away from personal consumption and into productive investment. *6.* That means cutting the public deficits.

7. The public begins to feel the pain immediately, as families' purchasing power drops. *8.* But the results of greater stability and higher investment will take years to develop — and governments under duress are not apt to last that long. *9.* Britain has been under severe wage controls for 16 months, imposing a calculated drop in living standards on the whole country. *10.* Italy and France have embarked on their own austerity programs in recent weeks. *11.* The reasons for these unwelcome and onerous policies are all but incomprehensible to most citizens. *12.* From a technical point of view, it was a sudden rise in prices of raw materials and fuel — most spectacularly, oil — that revealed the frailties of a prosperity very rapidly acquired in the 1960s. *13.* But the citizen sees it as new taxes and higher prices that are taking away some of the affluence that he thought he had already earned. *14.* The effect is to sharpen all the old quarrels over distribution of wealth and benefits. *15.* That strengthens the left in most of these countries.

16. The first results of Europe's new economics have not been terribly encouraging. *17.* By this time, Britain had hoped to be riding into a strong recovery led by an export boom. *18.* But the latest three months' figures show that British exports have, in fact, actually been falling. *19.* The Italian inflation rate is still rising and the government's attempts to cut consumption through price increases

will, at first, make it rise still faster. *20.* That foreshadows a further drop in the value of the lira next year. *21.* Even the immensely powerful and stable West German economy seems unlikely to do as well next year as its managers had hoped.

22. The European Common Market has set a target of 5 per cent growth a year for the next five years — the pace, its experts calculate, that is necessary to bring unemployment down to the levels that the governments consider tolerable. *23.* But in the capitals the economists are beginning to pass the word up to the cabinets that, for the nine countries of the Market, a rate of 5 per cent a year is highly improbable. *24.* Officials are beginning to discuss, quietly, the prospect of learning to live indefinitely with unemployment just about where it is now — the highest in a generation.

25. Every country has its own definition of social justice. *26.* When people think that they are being treated fairly, by their governments and by each other, they respond to public decisions in ways that help make policy work. *27.* Germany is a good example of the principle.

28. But if people's sense of justice is violated, they react in ways that will defeat even the sharpest of economic policies. *29.* If working people genuitely think that they are being exploited, they carry on a guerrilla warfare of strikes and demonstrations. *30.* If people with money expect to be pillaged by a hostile government, they hide it instead of investing it. *31.* There are a good many examples of that kind of thing in countries like Italy, France and Britain. *32.* That is why those governments have to go cautiously now in cutting social benefits.

33. There is a message here for the United States, which is pressing the debtor countries to cut their inflation rates and reduce their deficits. *34.* It is necessary, but it requires a great exercise of tact — not always an American virtue. *35.* Too little pressure risks that some of the Europeans will abandon austerity in all but name. *36.* Too great a pressure, and there is a much more serious risk that governments will collapse.

37. The United States needs to keep it in mind that the European economy tends to follow ours. *38.* When our recovery from the recession goes into a long pause, as it has done in recent months, the recovery in Europe is suddenly thrown into great doubt. *39.* If the American economy should not begin to pick up momentum very soon, the most severe effects would not be here but in Western Europe, in countries that are struggling to regain their balance. *40.* This country's domestic economic strategy is also, inadvertently, the most important element in its foreign policy for Europe.

TEXT 3

Discursive	*Communicative*
Titre : Performative	
1 POSITING	*Inform*
2 exemplification	
3-6 POSITING Explanation	
3 Positing	
4 positing (opposition to 3)	
5 consequence	
6 (reformulation)	
7 consequences (opposition)	
8	
9 exemplifications	
10	
11 POSITING	
12 explanation (opposition)	
13	
14 consequence	
15 consequence	
16 POSITING	
17 Exemplification (opposition)	*Prove*
18	
19 exemplification	
20	*prove*
21 exemplification	
22-24 exemplification	
25 POSITING	

Discursive	*Communicative*
26 positing	
27 exemplification	
28 positing : opposition to 26	
29 explicitation	
30 explicitation	
31 exemplification	
32 consequence	
33-34 POSITING	
33-36 Consequence	*advise*
34 commentary	
35 explicitation	
36	
37 POSITING	
38 exemplification	
38 exemplification	
40 POSITING	

The economics of the mid-1970s are creating a special kind of hell for governments and politicians throughout Western Europe. Over the last two decades all the Western European countries have built expensive structures of social benefits and security based on the assumption of strong economic growth. Now they have begun to realize that growth is unlikely to continue at a rate capable of sustaining these benefits or the accustomed levels of high employment. They are all trying to steer resources away from personal consumption and into productive investment. That means cutting the public deficits. The reasons for these unwelcome and onerous policies are all but incomprehensible to most citizens. The first results of Europe's new economics have not been terribly encouraging. Every country has its own definition of social justice. When people think they are being treated fairly, by their governments and by each other, they respond to public decisions in ways that help make policy work. But if people's sense of justice is violated, they react in ways that will defeat even the sharpest of economic policies. There is a message here for the United States, which is pressing the debtor countries to cut their inflation rates and reduce their deficits. That is necessary, but it requires a great exercise of tact — not always an American virtue. The United States needs to keep it in mind that the European economy tends to follow ours. This country's domestic economic strategy is also, inadvertently, the most important element in its foreign policy for Europe.

ANNEXE

Definition of the discursive terms used in the schemas.

Positing : utterance generative of the discursive development of the text or part of the text.

Performative : statement of previous and subsequent discursive intentions.

Explicitation : clarification (at content level) of terms or relationships between terms.

Explanation : clarification of discursive development or part of the discursive development of a text.

Consequence : generally accepted follow-up drawn from a preceeding utterance.

Deduction : writer-imposed inference drawn from a preceeding utterance.

Description : statement of all or a number of features particular to a given concept, object or event.

Definition : statement of the distinguishing features and/or functions of a given concept, object or event.

Characterisation : partial definition, stating the distinguishing feature(s) or function(s) relevant to the text.

Exemplification : statement illustrating a preceeding utterance.

Reformulation : re-statement in different words of a preceeding utterance, concept or proposition.

Evaluation : statement of writer's opinion.

Referencing : statement directing to information inside or outside a text.